

Effect of post-harvest drying of herbage on yield and quality of essential oil in the *Mentha* sp. EC-41911

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INTRODUCTION

The yield and quality of essential oil depend on mean temperature during growth period, stage of harvest, post-harvest handling of herbage and mode of distillation. Peppermint producers prefer to dry the herbage prior to distillation because dry mint is more economical to handle, less bulky and yields oil more readily on distillation consuming less steam, fuel and time³. On the contrary loss of oil yield as a result of post-harvest drying of herbage is reported in scented geranium.¹ On the contrary loss of oil yield as result of post-harvest drying of herbage on yield and quality is lacking. An experiment was conducted to study the effect of post-harvest drying of herbage on yield and quality of essential oil in *Mentha*.

MATERIALS & METHODS

An exotic *Mentha* species EC-41911 described as *M. arvensis* type (cv.), constituted the material for the present study. Herbage from the crop planted in March 1989 and March 1990 was harvested during June, 1989 and June 1990 respectively, as the essential oil content is reported to be high in June-July³. During June 1989, 250g samples of the herbage were weighed. One set was hydrodistilled in a Clavenger's apparatus immediately and other samples were hydrodistilled after storing for 1, 3 and 5 days in shade as well as in polythene covers at 30°C. Since there was not much difference in oil yield in these two methods of drying, only shade drying was taken up and two more treatments of 2 and 4 days were added during June, 1990. Each treatment was replicated thrice. The oil obtained from the above

treatments was dried over anhydrous sodium sulphate and its menthol and menthone contents were determined by GLC.

A Hewlett packard gas chromatograph fitted with FID and a stainless steel Column (6' X 1/8") packed with 10% carbowax on chromosorb w (80 - 100 mesh) was used. The operating conditions were set as follows. Detector and injector temperature 240°C. Column temperature 165-185°C at a rate of 2°C/min. N₂ was used as carrier gas at a flow rate of 25 ml/min.

RESULTS & DISCUSSION

The data on oil yield, menthol and menthone contents in the oil obtained in different treatments during 1989 are presented in Table 1. Treatment differences for oil yield, and menthone contents were highly significant; while differences for menthol content were nonsignificant. Oil yield was maximum (1.09%) in the herbage dried in polythene cover for 3 days followed by the herbage dried in shade (1.08%) for the same duration and for one day (1.03%).

Although five days drying in polythene cover improved menthol content to 70.07%, it reduced oil yield drastically, while treatment that gave maximum oil yield recorded slightly lower menthol, and hence appears to be optimal.

Menthone content was highest (9.87%) in the herbage dried for a day in polythene cover, while it was least in herbage dried in polythene cover for five days. Herbage dried for three days in polythene cover that recorded maximum oil yield and ranked second with regard to menthol content and had 9.15% menthone.

In 1990, differences for oil yield and menthol content were non significant. However, maximum oil yield (1.17%), was recorded by herbage shade dried for three days, followed by two days' (1.15%) and one day's (1.12%) drying.

Maximum menthol content (68.89%) was recorded by three days, followed by four (68.77%) and two days (68.71%) drying.

Menthone content was slightly higher in 1990. Differences among the treatments were highly significant. One day shade dried herbage recorded maximum menthone (12.38%) followed by two days (11.53) and one day (11.51%). It was minimum in herbage dried for five days (9.43%), and was slightly more (10.53%) in herbage dried for three days.

From the results presented it is evident that by shade drying the herbage for three days maximum oil yield could be obtained. Besides, to be of good grade mentha oil must have high menthol content and low menthone an undesirable component that imparts bitter taste to the oil. A cursory glance at the menthol and menthone

contents corresponding to the three days shade drying treatment shows that, menthol content was highest in 1990, while it was second in order during 1989. Menthone content too was considerably lower in this treatment, during both the years. Hence, shade drying of mentha herbage for three days at 30°C can be recommended for obtaining maximum yield of good quality essential oil.

REFERENCES

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TABLE - 1 JUNE, 1989

Sl. Treatments No.	Mean Oil yield(% on FWB)	Mean Menthol Content(%)	Mean Menthone (%)
1. Fresh herbage	1.01	69.2	9.17
2. Shade dried -one day	1.03	68.85	6.72
3. Polythene dried - "	1.02	68.62	9.87
4. Shade dried - three days	1.08	68.73	9.60
5. Polythene - "	1.09	69.54	9.15
6. Shade dried - five days	0.92	68.64	9.27
7. Polythene - "	0.93	70.07	6.40
G.M.	1.012	69.090	8.597
SEM	0.011	0.41	0.096
CD at 5%	0.035**	NS	0.294
Cd at 1%	0.049**	NS	0.413**
CV.%	1.94	1.02	1.926

N.S = Not Significant.
** = Highly Significant (at 1%)

TABLE - 2 JUNE, 1990

Sl. Treatments No.	Mean oil yield(%)	Menthol (%)	Menthone (%)
1. Fresh herbage	1.08	68.58(IV)	11.51(III)
2. 1 Day shade dried	1.12	68.39	12.38(I)
3. 2 Days - do -	1.15	68.71(III)	11.53(II)
4. 3 Days - do -	1.17	68.89(I)	10.53
5. 4 Days - do -	1.05	68.77(II)	11.14(IV)
6. 5 days - do -	0.98	68.39	9.43
G M	1.092	68.62	11.09
S E M	0.045	0.694	0.19
CD at 5%	N.S	N.S	0.60
CD at 1%	N.S	N.S	0.85**
CV %	7.19	1.75	2.98

N.S = Not Significant.

** = Highly Significant (at 1%)